

## CLAIMS:

1. A fluid measurement system comprising an imaging means for taking images of particles contained in a fluid to be measured at small time intervals,  
5 a control means for controlling said imaging means, and an image processing means for comparing luminance pattern distributions at a plurality of consecutive time points obtained by said imaging means to measure a moving direction and a moving amount of a particle group, and analyzing a flow field of the fluid to be measured,  
10 said imaging means comprising a long focus optical system being of a long distance type capable of imaging a fluid to be measured a long distance away, and  
said long focus optical system being provided with a shield which shields a part including a central portion of a main mirror at an arbitrary  
15 shield rate.
2. The fluid measurement system according to claim 1, wherein  
the shield rate found by a ratio of a diameter of said shield to an aperture of said long focus optical system is provided to be arbitrarily adjustable.
- 20 3. The fluid measurement system according to claim 1 or 2, wherein  
said shield rate is set in a range of 20% to 60% when one particle image obtained by the imaging means across two pixels or more, and is set in a range of 0% to 40% when a plurality of particle images are contained in one pixel.
- 25 4. The fluid measurement system according to any one of claims 1 to 3, wherein

a secondary mirror included in said long focus optical system is supported by parallel plate glasses whose surfaces are disposed to be oriented in a direction perpendicular to an optical axis of a main mirror in the lens barrel.

- 5 5. The fluid measurement system according to any one of claims 1 to 4, wherein

said imaging means is of a long distance type capable of imaging a luminance pattern distribution by natural light reflection in the fluid to be measured a long distance away.

- 10 6. The fluid measurement system according to any one of claim 1 to claim 4, further comprising:

a laser light input means for inputting a laser light in a sheet form into the fluid to be measured,

- 15 wherein said imaging means is of a long distance type capable of imaging a luminance pattern distribution by the laser light reflection in the fluid to be measured a long distance away.

7. The fluid measurement system according to any one of claim 1 to claim 6, wherein

- 20 said imaging means is of a long distance type capable of imaging the fluid to be measured 10 m or greater and 20 km or less away from the set position of said imaging means.

8. A long focus optical system constructed by supporting a main mirror and a secondary mirror in a mirror barrel, comprising

- 25 a shield which shields a part including a central portion of the main mirror at a predetermined shield rate.

9. The long focus optical system according to claim 8, wherein

the shield rate found by a diameter of said shield with respect to an aperture is settable in a range from 20% to 60% when one particle image obtained by an imaging means is across two pixels or more, and is settable in a range from 0% to 40% when a plurality of particle images are contained in one pixel.

10. The long focus optical system according to claim 8 or claim 9, wherein

said secondary mirror is supported by parallel plate glasses whose surfaces are disposed to be oriented in a direction perpendicular to the optical axis of a main mirror in the lens barrel.

11. The long focus optical system according to any one of claim 7 to claim 10, said long focus optical system being used in an imaging means in a fluid measurement system comprising an imaging means for taking images of particles contained in a fluid to be measured a long distance away at small time intervals, a control means for controlling said imaging means, and an image processing means for comparing luminance pattern distributions at a plurality of consecutive time points obtained by said imaging means to measure a moving direction and a moving amount of a particle group, and analyzing a flow field of the fluid to be measured.